SONY

THE COMPANY THAT SET THE STANDARDS FOR CD PLAYERS...

CD Players

...NOW EXERCISES ITS RIGHT TO RAISE THEM.

In the last two years, every major audio manufacturer has introduced at least one Compact Disc player. Because they employed much of the same first and second generation technology, many of these CD players were quite similar in design and performance. So similar, in fact, that some audio pundits seriously wondered if distinctions between brands would soon disappear.

This year, Sony answers that question with a resounding "No." Our new third-generation CDP-302 and CDP-102 are significantly different from other CD players. They provide important improvements in nearly every area of CD performance.

Why is Sony able to build a better CD player? Simple. We co-invented the Compact Disc format. Our first CD player was also the world's first. So, while the competition struggled to catch up, we had nearly two years to improve our original design.

And because we make and sell more CD players than anyone, we have the resources to develop new applications for our CD technology. This year, for example, Sony is offering the first CD player for your car. The first portable CD player. And the world's first CD radio cassette player!

In fact, Sony's latest CD technology sets new standards for the industry.

Our new UniLinear Converter, for example, solves the problems associated with the conversion of the digital information on the disc into the analog signal you hear upon playback. The UniLinear Converter provides the ideal combination of phase linearity, excellent frequency response, and drastically reduced intermodulation distortion.

We've also made operating Sony CD players more convenient. Our new Linear Motor Tracking mechanism can locate any point on the disc in one second or less. So you spend more time enjoying the music. And less time waiting around.

Other improvements include a completely redesigned laser assembly. It's now simpler, more compact, and more reliable. So is our new high density VLSI circuitry. Result? More advanced performance for your money.

Impressive? Yes. But not unexpected. Not when you consider the company that started the digital revolution in the first place.

CDP-302

CDP-102

COMPACT DISC PLAYER

"...In both performance and ease and flexibility of operation, the CDP-302 is a superb machine, outclassing many of its more expensive competitors...."

HIGH FIDELITY—April 1985

COMPACT DISC PLAYER

"...The 102 sounds nearly as good as the best and most expensive CD players on the market. Few players at any price can deliver sound with the clarity and depth of field of this unit...."

DIGITAL AUDIO—March 1985

SONY'S NEW CD TECHNOLOGY MAKES EVEN NEAR-PERFECTION OF DIGITAL AUDIO SOUND

Although they look like conventional CD players, the CDP-302 and CDP-102 include Sony's unparalleled third-generation engineering. It makes them the CD players of choice if you want today's finest digital technology.

A New Approach to Digital Circuitry

Even though digital audio components offer tremendous advances over any analog system, the technology does raise a few technical issues of its own.

One of the most controversial is how to deal with undesirable aliasing noise. Aliasing noise is a by-product of the digital process. Uncontrolled, you would hear it as annoying high frequency distortion.

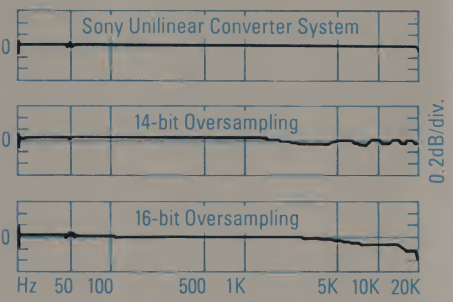
Some CD players use steep slope-rate analog filters to neutralize this noise. While they are generally effective, the analog filter's "brick wall" effect means that anything above its frequency of operation is completely "chopped" off. Consequently, phase linearity suffers, and frequency uniformity at the highest audio frequencies is only marginal.

Other CD players use a method called "oversampling" to raise the digital conversion frequency to a point well beyond the audible range. While providing no additional *music* information, this system has the advantage of providing better high frequency response and minimal phase shift. However, even with both a digital *and* a final stage analog filter, most oversampling system's more complex circuitry creates additional problems with high frequency spurious noise.

The Best of Both Worlds: Sony's Unilinear Converter System

Our unique Unilinear Converter and digital filtering system provides the benefits of both previous designs. Unlike other methods, our high-speed D/A converter utilizes single, "master clock" architecture to control all digital functions. This eliminates the "beat frequencies" caused by the interaction of various clock rates found in typical oversampling designs—along with their attendent frequency irregularities. Data synchronization is theoretically perfect. And frequency response is absolutely unprecedented—± 0.1 dB deviation in typical measurements!

Frequency Response: Sony vs. the Competition

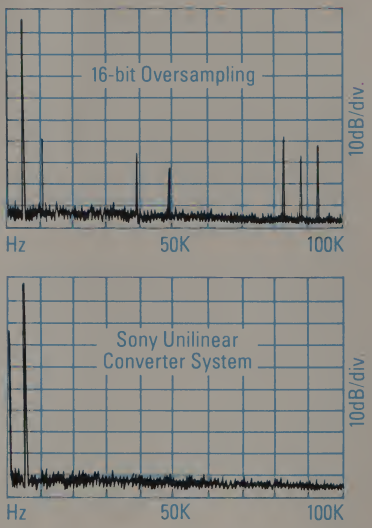


*"...And the frequency response is simply the best we have seen—within hundredths of a dB across the entire audible band...."**

And with its integrated system of 88.2 kHz oversampling and high resolution 96th order digital filter, the Unilinear Converter attenuates spurious noise by a remarkable 80 dB! That's almost twice as effective as most conventional oversampling/digital systems. Plus, Sony's digital filter, combined with a gentle slope rate final stage analog filter, limits 'ripple' factor to a mere ± 0.01 db...as well as contributing to one of the best phase response characteristics in the industry!

THE BETTER

Noise Spectrum Comparison



*"...The complete absence of the gentle rippling we have seen in the high-frequency responses of other players incorporating digital output filters...."**

No spurious noise. Spectacular frequency response. Superb phase linearity. Only Sony offers a total solution to the problems created by the digital conversion process.

The Superstar of Microchips

In Sony's third-generation CD players, one tiny VLSI replaces the multiple LSIs used in most CD players. It handles all 9 primary digital functions (error correction, sync detection, etc) for all the new Sony CD players. Because it provides a simpler signal path, Sony's new VLSI also reduces distortion and increases reliability. And it generates less heat and consumes less power.

It's safe to say that, in the world of microchips, Sony's unique new VLSI is literally in a class by itself.

Designing A Better Laser Pick-Up

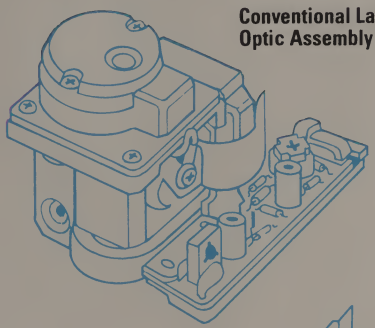
A laser pick-up in a CD player requires four main attributes: Blinding speed for fast track access. Excellent stability and reliability. Superior tracking. And a margin for error of less than two microns (a micron is a *billionth* of an inch).

First- and second-generation CD players transfer torque from the motor to the pick-up using a complex worm gear and reduction gear mechanism. Unfortunately, this system does not provide smooth, accurate tracking. Nor does it balance the contradictory requirements of high access speed and pinpoint cueing.

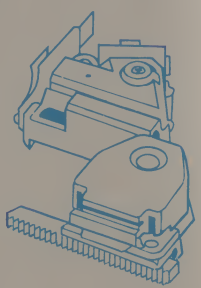
The result is occasional mis-tracking. And that causes less than ideal performance.

Which is why Sony developed the new third-generation Linear Motor Tracking system. The motor's torque is transferred directly to the pick-up. So the worm gear and reduction gears—along with their adverse mechanical

Conventional Laser Optic Assembly



Sony Miniaturized Laser Optic Assembly



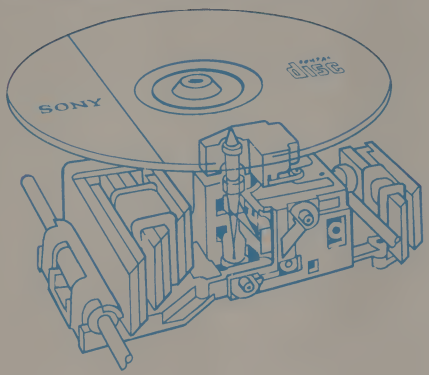
effects, like "play," backlash, and friction —are eliminated. And since it has fewer moving parts, the linear non-cogging motor system is also more reliable.

The Linear Motor Tracking system would not have been practical (or even possible) with the relatively large, heavy laser used in first- and second-generation players. So we created a new miniature laser pickup. That's one-third smaller and lighter than previous models. Combined with our "3 spot" laser design the Linear Motor Tracking system is smaller and more precise. And it's also simpler and more reliable.

A Laser Fast As The Speed Of Light

Best of all, Sony's third generation laser assembly and Linear Motor Tracking system is fast—the fastest in the

Sony Linear Motor Tracking System



*"...The fastest, most precise cueing we have encountered in a CD player...."**

industry. It can access *any* location on the disc in *less than one second!* Try locating a selection with any other CD player. Some take as much as 15 times longer to find a selection.

A Better Whole Starts With Better Parts

In the high-performance world of digital audio, small imperfections are much more noticeable. Any weak link in the system reduces the accuracy and quality of the overall sound. So for our third-generation CD players, Sony incorporated our very finest analog parts and components.

A new audio operation amp, for example, has been designed with separate signal paths for the left and right channels. This results in better heat dissipation, lower crosstalk and low distortion.

Special ceramic powder mixed electrolytic capacitors transmit their charge more effectively than typical capacitors. So rise-time and pulse response characteristics are excellent.

This attention to detail may seem a bit obsessive to listeners interested only in great sound. But digital technology demands great imagination and attention to detail. That's why, for the CDP-302 and CDP-102, nearly every key circuit has been redesigned. Every mechanism re-thought. Every feature re-examined.

The result is two of the finest, most refined, best sounding CD players you can buy.

And because the CDP-302 and CDP-102 are priced like conventional machines, they represent two of the best values in high-fidelity.

**High Fidelity—April 1985*

CDP-70

COMPACT DISC PLAYER

Sony Proudly Announces the Latest Addition to the Family

(Also available in a silver finish.)

The new Sony CDP-70 upholds the family tradition of superior CD quality. Its contribution of technology, features, and design make it an unprecedented value in its class.

For example, there's the famous Sony digital engineering to make certain the CDP-70 sounds great. Including Sony's unique 16-bit digital-to-analog convertor. It's the same circuitry made famous by our precedent-setting PCM-F1 digital processor.

What's more, Sony's miniature laser optical pick-up integrates the semiconductor laser, lenses, and splitter mirror into compact, reliable assembly. So track access is fast and precise.

And, to balance this optimum laser tracking with superior resistance to shock and vibration, the CDP-70 is also equipped with our "3 spot" advanced servo system that maintains the laser's stability at any position on the disc.

Moreover, even though the CDP-70 is one of Sony's lowest priced CD players, it nevertheless includes our most popular CD convenience features.

To make it easy to locate your favorite tracks, we've included Sony's Automatic Music Sensor.™ It skips backward or forward to any selection with the touch of a button. Random Music Search allows you to program up to sixteen of your favorite songs for playback in any sequence. And, with the CDP-70's repeat capability, you can replay a song or the entire disc as many times as you'd like.

Even remote control capability is possible with the optional Sony RM-D1K Remote Commander.™

To keep you informed of the disc's status, the CDP-70 is equipped with a fluorescent display. It shows you track number, repeat and program modes, and whether the disc is loaded. In addition, the time display indicates total disc time, time remaining or elapsed time for each selection. This is especially useful when locating a specific passage on a classical recording.

The CDP-70 is an affordable CD player that sounds great and is a delight to use. All this makes it a worthy addition to Sony's widely acclaimed family of compact disc players.

SONY CD PLAYERS: THE MOST CONVENIENT AUDIO COMPONENTS WE'VE EVER MADE.

Convenient operation is one of the main reasons for the success of the CD format. The discs are small and very rugged for easy handling and storage. The precision of the laser pick-up makes it easy to find a specific song or passage. Even the player itself is compact, and the front loading format eliminates wasted headroom.

In addition to these generic advantages, Sony has added a number of other convenience features to its new series of CD players.

But we haven't encumbered either player with unnecessary frills. Instead we carefully chose the features our experience tells us Sony customers want most.

Which allows us to offer one of the most sought-after features of all— a reasonable price tag.

Linear Motor Tracking System

A SAMPLING OF SONY'S CONVENIENCE FEATURES

- Automatic Music Sensor™ (AMS) quickly locates and plays up to 99 selections—either forward or backward
- Random Music Sensor (RMS) lets you program up to 16 songs for playback in any sequence (CDP-302/CDP-70)
- Direct Access™ track selection via remote control lets you select any of up to 99 songs at the touch of a button. This means you can start playing any song on the disc within one second (CDP-302/CDP-102)
- Index search begins play at up to 99 specially subcoded index points within a piece of music—to find selections of a symphonic movement, for example
- Two speed manual search allows you to listen to music at normal pitch or search through the disc at high speed
- Repeat capability can replay one song, the entire disc, or any musical passage between two points you specify (the CDP-302/CDP-70 will also repeat the RMS programmed sequence)
- Fluorescent concentrated display indicates total track and time, track number, index number, tracks elapsed time, time remaining on the disc, disc status, and repeat status
- Switchable time display indicates either the time remaining or the time elapsed on each track; especially handy for locating precise positions in classical musical pieces
- Multi-function wireless Remote Control Commander™ can provide track selection, indexing, manual search, AMS, play, pause, repeat functions, and time display switch
- Push loading automatically closes the door and places the disc into a standby play mode
- Headphone output jack with variable level control (CDP-302/CDP-70)
- Graphics sub-code output port for future CD graphic applications (CDP-302/CDP-102)

FEATURES AND SPECIFICATIONS

MODELS	CDP-302	CDP-102	CDP-70
Wireless Remote Commander	Yes (with suppl. RM-D302)	Yes (with suppl. RM-D302)	Yes (with opt. RM-D1K)
RMS # Songs	16	—	16
AMS	Yes	Yes	Yes
Twenty Key, Direct Access	Via remote	Via remote	—
INDEX Access	Yes	Yes	—
Elapsed/Remaining Time	Yes	Yes	Yes
Repeat A-B	Yes	Yes	—
Repeat One Song	Yes	Yes	Yes
Repeat Disc	Yes	Yes	Yes
Cue and Review	Yes	Yes	Yes
Elapsed/Remaining Display	Yes	Yes	Yes
Headphone Jack	Yes (with vol.)	—	Yes (with vol.)
Unilinear Converter System	Yes	Yes	—
Digital Filter/Over Sampling	Yes	Yes	—
Linear Motor Tracking System	Yes	Yes	—
SPECIFICATIONS			
Frequency Response	2-20.000 HZ ±0.5 dB	2-20.000 HZ ±0.5 dB	2-20.000 HZ ±0.5 dB
Distortion @1 KHZ	0.003%	0.003%	0.004%
Dynamic Range	96 dB	96 dB	90 dB
Channel Separation	95 dB	95 dB	90 dB
Wow & Flutter	Unmeasurable	Unmeasurable	Unmeasurable
Power Requirements	AC-120 V 60 HZ	AC-120 V 60 HZ	AC-120 V 60 HZ
Power Consumption	15 Watts	15 Watts	13 Watts
GENERAL			
Dimensions			
Width	17″ 430 mm	14″ 355 mm	17″ 430 mm
Height	3 1/4″ 80 mm	3 1/4″ 80 mm	2 7/8″ 70 mm
Depth	13 1/4″ 335 mm	13 1/4″ 335 mm	11 1/8″ 280 mm
Weight	14lbs. 13 oz. 6.7 kg	12lbs. 9 oz. 5.7 kg	9lbs. 1 oz. 4.1 kg

Note: All features and specifications subject to change without notice.

SONY®

THE LEADER IN DIGITAL AUDIO.™

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